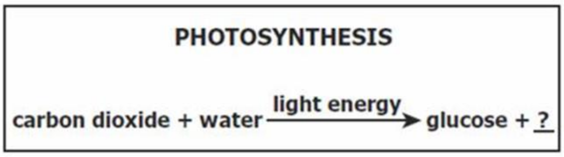
WORKSHEET - 1

NUTRITION IN PLANTS

ANALYTICAL MCQS



PHOTOSYNTHESIS

$$\text{carbon dioxide} + \text{water} \xrightarrow{\text{light energy}} \text{glucose} + \underline{?}$$

1. The equation for photosynthesis is shown above.

   Which of these is required to complete the equation for photosynthesis?

   (A) Carbon (B) Oxygen (C) Hydrogen (D) Nitrogen

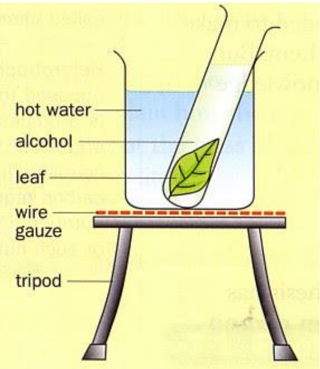
2. The survival of heterotrophs depends directly or indirectly on
   (A) Decomposers (B) Parasites (C) Autotrophs (D) Consumers

3. In a mesophyll cell of a leaf, the synthesis of ATP occurs in which of the following?
   I. Ribosomes II. Mitochondria III. Chloroplasts
   (A) I only (B) II only (C) III only
   (D) II and III only (E) I, II, and III

4. The teacher instructed a student to place a healthy potted. Shoe flower plant in a dark room for 24 hours prior to an experiment on photosynthesis. The purpose of placing it in a dark room is
   (A) Increase the intake of $CO2$
   (B) To activate the chloroplast in leaves
   (C) To destarch the leaves
   (D) To denature the enzymes in the leaves

5. Water is always needed by the plants for its use during photosynthesis. It is absorbed by the root of the plant from the soil through the process of __________.
   (A) Oxidation (B) Osmosis (C) Diffusion (D) Ascent of sap

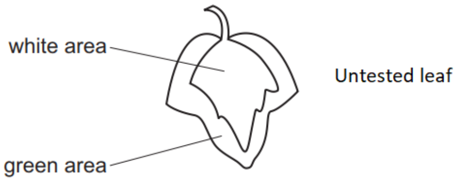
6. What is the purpose of the given experimental setup while performing starch test?

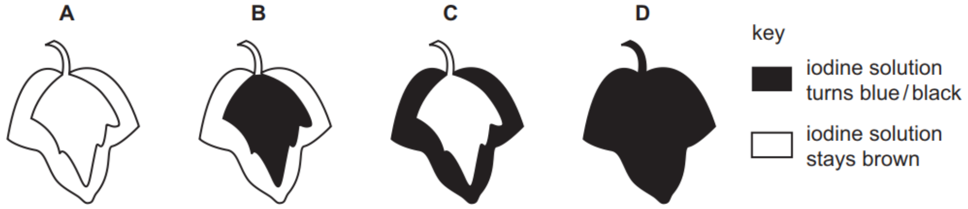


   (A) To soften the leaf (B) To remove chlorophyll
   (C) To kill the leaf cells (D) All of the above

7. In a photosynthesis experiment, a plant is left in bright sunlight for several hours. A leaf is then removed from the plant and tested for starch, using iodine solution.

The diagram shows the leaf from the plant that was used in the experiment.




A
B
C
D
key
iodine solution turns blue / black
iodine solution stays brown

Which diagram shows the result of the experiment?

(A) C (B) A (C) D (D) B

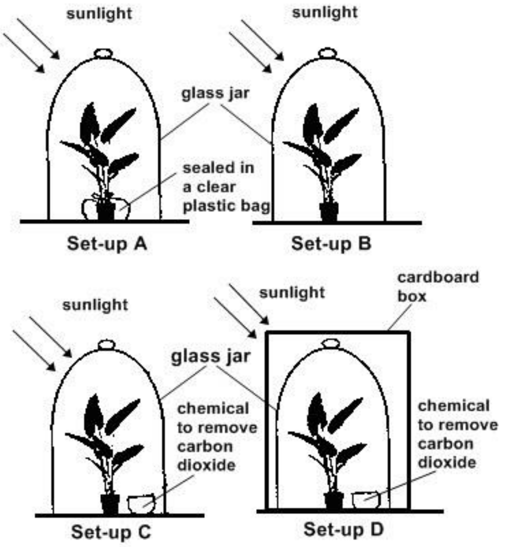
CASE STUDY MCQS

I)

A student performed an experiment to demonstrate that a plant needs chlorophyll for photosynthesis.
He used plants that had green leaves with white areas.
After exposing the plants to sunlight, he removed a leaf from each plant and processed the leaves to remove the chlorophyll.
He then tested each leaf for the presence of starch.
Starch was found in the area of the leaf that was green, and no starch was found in the area of the leaf that was white.
He concluded that chlorophyll is necessary for photosynthesis. Which statement represents an assumption the student had to make in order to draw this conclusion?

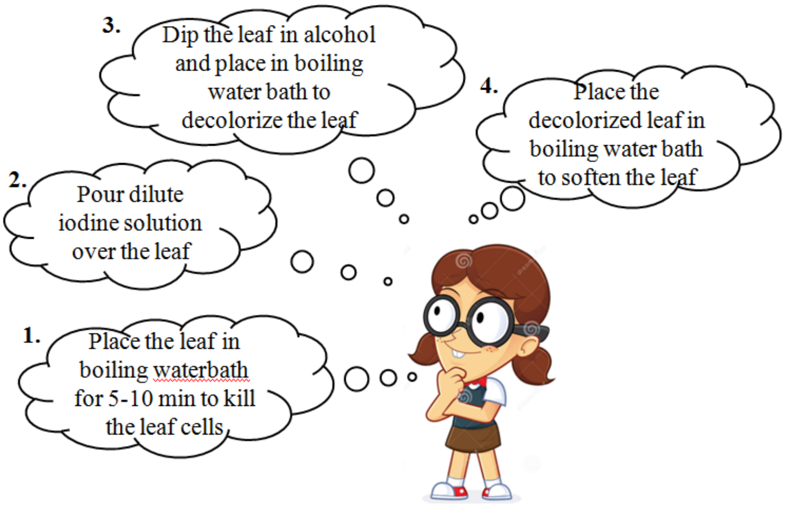
(A) Starch is synthesized from the glucose produced in the green areas of the leaf.
(B) Starch is converted to chlorophyll in the green areas of the leaf.
(C) The white areas of the leaf do not have cells.
(D) The green areas of the leaf do not have cells.

II) Alex wanted to show that carbon dioxide is needed for photosynthesis. He sets up an experiment using the four setups as shown in the given diagram. Which two setups should Alex use for his investigation?


sunlight
sunlight
glass jar
sealed in a clear plastic bag
Set-up A
Set-up B
sunlight
sunlight
cardboard box
glass jar
chemical to remove carbon dioxide
chemical to remove carbon dioxide
Set-up C
Set-up D

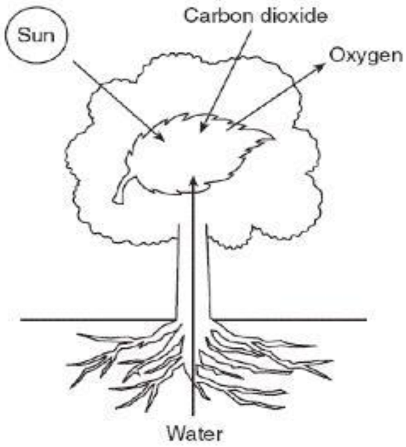
(A) A and C (B) A and D (C) B and C (D) B and D

III) Following are certain steps followed while conducting experiments on photosynthesis. Find the correct sequence to test a leaf for starch:


3. Dip the leaf in alcohol and place in boiling water bath to decolorize the leaf
4. Place the decolorized leaf in boiling water bath to soften the leaf
2. Pour dilute iodine solution over the leaf
1. Place the leaf in boiling waterbath for 5-10 min to kill the leaf cells

(A) 1→2 → 3 → 4 (B) 2→3 → 4 → 1
(C) 1→3 → 4 → 2 (D) 4→3 → 1 → 2

IV) The diagram below represents events associated with a biochemical process that occurs in some organisms:



Which statement concerning this process is correct?

(A) The process represented is respiration and the primary source of energy for the process is the Sun
(B) The process represented is photosynthesis and the primary source of energy for the process is the Sun
(C) This process converts energy in organic compounds into solar energy which is released into the atmosphere.
(D) This process uses solar energy to convert oxygen into carbon dioxide.

V) Read the passage given below and answer the questions no. 1 to 6. Animals can't produce their food themselves; they obtain their food from green plants. Whereas green plants are capable to convert solar energy into chemical energy for the production of food. This process is represented by following equation.

$6CO_2 + 12H_2O \xrightarrow{\quad} C_6H_{12}O_6 + 6O_2 + 6H_2O$

(1) The process represented by above equation is
(A) Photosynthesis
(B) Reduction of carbohydrates
(C) Reduction
(D) Protein synthesis

(2) The gas produced in above process is
(A) Oxygen
(B) Carbon dioxide
(C) Water vapor
(D) All of the above

(3) The essential factors for above process are
(A) Temperature and cytoplasm
(B) Sunlight and chlorophyll
(C) Chlorophyll and Humidity
(D) Sunlight and Air

(4) This process is stopped at night because-
(A) CO_2 increase
(B) O_2 decrease
(C) Water is not transported
(D) sunlight is not available

(5) In which substance the chemical energy is stored by the above process?
(A) O_2
(B) CO_2
(C) $C_6H_{12}O_6$
(D) H_2O

(6) The process of photosynthesis in green plants involves -
(A) Intake of nitrogen and release of oxygen
(B) Intake of oxygen and release of nitrogen
(C) Intake of carbon dioxide and release of oxygen
(D) Intake of oxygen and release of carbon dioxide

ASSERTION REASON MCQS

Directions: In the following questions, a statement of assertion is followed by a statement of reason.

Mark the correct choice as:
(a) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
(b) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
(c) If Assertion is true but Reason is false.
(d) If both Assertion and Reason are false.
(e) If Assertion is false but Reason is true.

(1) Assertion: Autotrophs make their own food.
Reason: Heterotrophs depend on green plants for their food.

(2) Assertion: Molecular movements are needed for life.
Reason: Body structures made up of these molecules need continuous repair and maintenance.

(3) Assertion: Photosynthesis takes place in green parts of the plants.
Reason**:** Photosynthesis always takes place in leaves.

(4) Assertion: Site of photosynthesis is the chloroplast
Reason**:** Mitochondria is the site of aerobic respiration in the cell.

(5) Assertion: Other material like nitrogen is also taken up from the soil by plants for nutrition.
Reason: Nitrogen is an essential element used in the synthesis of proteins and other compounds.

(6) Assertion: Mode of nutrition in higher animals is heterotrophic
Reason: Animals can use different trophic levels for heterotrophic nutrition

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